

We claim:

1. An apparatus for detecting TWA in potential cardiac patients comprising:
  - a sensor adapted to sense an ECG from a patient;
  - a T wave detector adapted to detect a plurality of T waves in said ECG;
  - an analyzer adapted to perform at least one of the statistical tests and a periodicity transform on characteristics of said T waves to make a decision on whether TWA are present or not.
2. The apparatus of claim 1 wherein said analyzer is adapted to perform at least one of the following statistical tests: difference in means, adjacent values, Raleigh and number of zero crossings.
3. The apparatus of claim 1 wherein said analyzer performs both said statistical test and said periodicity transform, said analyzer including a combining element adapted to combine the results of said tests to generate said decision.
4. The apparatus of claim 1 wherein said T wave detector is adapted to detect at least one of the following T wave characteristics: peak value, area under the T wave, curvature, ST segment slope, and area of smaller T wave segments.
5. The apparatus of claim 4 wherein said analyzer is adapted to determine said characteristic for a plurality of consecutive T waves to form a series, said analyzer being adapted to operate on said series.

6. The apparatus of claim 5 further comprising a template generator adapted to generate a template for said T waves based on the characteristics of a plurality of T waves.

5        7. The apparatus of claim 6 further comprising a comparator adapted to compare a current T wave to said template, and to reject said current T waves from processing if it differs substantially from said template.

10      8. An apparatus for detecting TWA in potential cardiac patients comprising:  
                a sensor adapted to sense an ECG from a patient;  
                a T wave detector adapted to detect a plurality of T waves in said ECG;  
                an analyzer adapted to perform a periodicity transform on  
characteristics of said T waves to make a decision on whether TWA are  
present or not.

15      9. The apparatus of claim 8 wherein said T wave detector is adapted to detect at least one of the following T wave characteristics: peak value, area under the T wave, curvature, ST segment slope, and area of smaller T wave segments.

20      10. The apparatus of claim 9 wherein said analyzer is adapted to determine said characteristic for a plurality of consecutive T waves to form a series, said analyzer being adapted to operate on said series.

25      11. The apparatus of claim 10 wherein said analyzer is adapted to project said series into 1-p space to detrend said series.

12. The apparatus of claim 11 wherein said analyzer is adapted to project said series into a 1-p space and a 2-p space, to determine a result for each projection and to combine the results of said projections to make said decision.

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13. The apparatus of claim 8 further comprising a template generator adapted to generate a template for said T waves based on the characteristics of a plurality of T waves.

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14. The apparatus of claim 13 further comprising a comparator adapted to compare a current T wave to said template, and to reject said current T waves from processing if it differs substantially from said template.

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15. A method of detecting the presence of TWA in a cardiac patient comprising the steps of:

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- detecting an ECG from the patient;
- sensing a plurality of T waves in said ECG;
- determining a characteristic of said T waves;
- performing a periodic transform on said characteristics;

16. The method of claim 15 further comprising the step of making a decision about the presence of TWA based on said periodic transform.

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17. The method of claim 15 further comprising performing at least one statistic

test on said characteristics and generating a result based on said statistic test.

18. The method of claim 16 further comprising performing a plurality of different statistic tests on said characteristics, generating a result for each test and  
5 combining said results into a single decision.

19. The method of claim 15 further comprising generating a template based on said characteristic and using said template to discriminate between normal and ectopic beats.

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20. A method of detecting the presence of TWA in a cardiac patient comprising  
the steps of:  
detecting an ECG from the patient;  
sensing a plurality of T waves in said ECG;  
15 determining a characteristic of said T waves;  
performing a statistical test on said characteristics;  
making a decision about the presence of TWA based on said statistical tests.

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